SMART CONTRACT CODE REVIEW AND SECURITY ANALYSIS REPORT

Customer: PureFi

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Hacken OÜ
Parda 4, Kesklinn, Tallinn,
10151 Harju Maakond, Eesti,
Kesklinna, Estonia
support@hacken.io

Document

Name	Smart Contract Code Review and Security Analysis Report for PureFi.
Approved by	Andrew Matiukhin | CTO Hacken OU
Type	Vesting, Farming, Token
Platform	Ethereum / Solidity
Methods	Architecture Review, Functional Testing, Computer-Aided Verification, Manual Review
Repository	1.https://github.com/purefiprotocol/token 2.https://github.com/purefiprotocol/eth-bsc-swap-contracts 3. https://github.com/purefiprotocol/eth-bsc-swap-contracts
Commit	1. bbb66a17e4f452d3aa999fabb82a432e9b56d0be 2. d010f53f859a589a31a7d9b55104f77ab0df87d1 3. 49c7ef02654ecadfb877e7330f4876820fe27045
Timeline	22 July 2021 - 11 October 2021
Changelog	11 October 2021 - Initial Audit

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Introduction

Hacken OÜ (Consultant) was contracted by PureFi (Customer) to conduct a Smart Contract Code Review and Security Analysis. This report presents the findings of the security assessment of Customer's smart contract and its code review conducted between July 22nd, 2021 - October 11th, 2021.

Scope

The scope of the project is smart contracts in the repository:

```
Repository 1:  https://github.com/purefiprotocol/token
Commit 1: bbb66a17e4f452d3aa999fabb82a432e9b56d0be
Files:
	contracts/PureFiPaymentPlan.sol
	contracts/PureFiLinearPaymentPlan.sol
	contracts/PureFiFixedDatePaymentPlan.sol
	contracts/PureFiFarming.sol
	contracts/PureFiToken.sol
	contracts/PureFiBotProtection.sol

Repository 2: https://github.com/purefiprotocol/eth-bsc-swap-contracts
Commit 2: d010f53f859a589a31a7d9b55104f77ab0df87d1
Files:
	contracts/bep20/BEP20TokenImplementation.sol
	contracts/bep20/PureFiBotProtection.sol

Repository 3: https://github.com/purefiprotocol/eth-bsc-swap-contracts
Commit 3: 49c7ef02654ecadfb877e7330f4876820fe27045
Files:
	contracts/ETHSwapAgentImpl.sol
	contracts/BSCSwapAgentImpl.sol
```

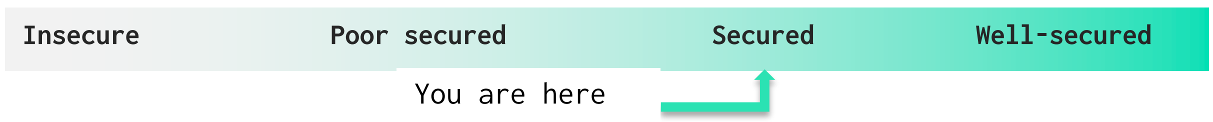
We have scanned this smart contract for commonly known and more specific vulnerabilities. Here are some of the commonly known vulnerabilities that are considered:

Category	Check Item
Code review	▪ Reentrancy ▪ Ownership Takeover ▪ Timestamp Dependence ▪ Gas Limit and Loops ▪ DoS with (Unexpected) Throw ▪ DoS with Block Gas Limit ▪ Transaction-Ordering Dependence ▪ Style guide violation ▪ Costly Loop ▪ ERC20 API violation ▪ Unchecked external call ▪ Unchecked math ▪ Unsafe type inference ▪ Implicit visibility level ▪ Deployment Consistency ▪ Repository Consistency

	▪ Data Consistency
Functional review	▪ Business Logics Review ▪ Functionality Checks ▪ Access Control & Authorization ▪ Escrow manipulation ▪ Token Supply manipulation ▪ Assets integrity ▪ User Balances manipulation ▪ Data Consistency manipulation ▪ Kill-Switch Mechanism ▪ Operation Trails & Event Generation

Executive Summary

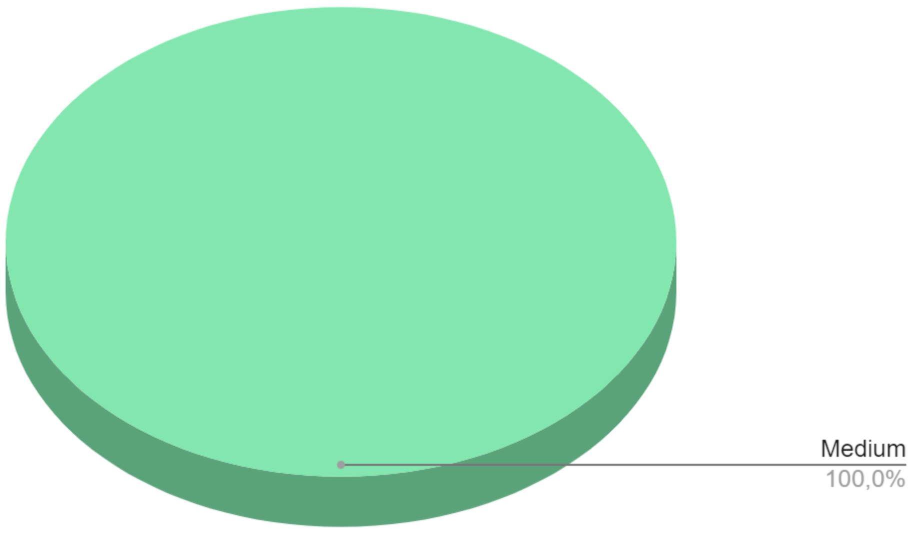
According to the assessment, the Customer's smart contracts are secured but contains some edge cases that are recommended to fix.



Our team performed an analysis of code functionality, manual audit, and automated checks with Mythril and Slither. All issues found during automated analysis were manually reviewed, and important vulnerabilities are presented in the Audit overview section. All found issues can be found in the Audit overview section.

As a result of the audit, security engineers found **3** medium issues.

Graph 1. The distribution of vulnerabilities after the audit.



Severity Definitions

Risk Level	Description
Critical	Critical vulnerabilities are usually straightforward to exploit and can lead to assets loss or data manipulations.
High	High-level vulnerabilities are difficult to exploit; however, they also have a significant impact on smart contract execution, e.g., public access to crucial functions
Medium	Medium-level vulnerabilities are important to fix; however, they can't lead to assets loss or data manipulations.
Low	Low-level vulnerabilities are mostly related to outdated, unused, etc. code snippets that can't have a significant impact on execution

Audit overview

■ ■ ■ ■ Critical

No critical issues were found.

■ ■ ■ High

No high severity issues were found.

■ ■ Medium

1. An `` `_lpTokenAddress` `` parameter is not validated and reward balances can be messed up.

   Contracts: PureFiFarming.sol

   Function: addPool

   Recommendation: ensure that lp token does not yet exist.

2. When a reward token and the LP token are essentially the same token, the reward and LP tokens staked by users are mixed. Which may lead to the fact that that user cannot withdraw LP tokens in case farming contract lacks reward tokens (or on case of miscalculations when reward tokens sent to contract).

   Contracts: PureFiFarming.sol

   Function: addPool

   Recommendation: forbit setting reward token as LP token.

   Customer notice: Such a case will not happen if calculations are done properly and contract is fully funded with reward tokens expected to be claimed by users.

3. `` `isContract` `` function returns false in a case when a call is made from a constructor function of another contract. So this validation becomes useless and only consumes extra gas. Validating tx origin is enough to ensure that a caller is not a contract.
   Contracts: BSCSwapAgentImpl.sol, ETHSwapAgentImpl.sol
   Functions: notContract
   Recommendation: remove useless validation.

■ Low

No low severity issues were found.

Conclusion

Smart contracts within the scope were manually reviewed and analyzed with static analysis tools.

Audit report contains all found security vulnerabilities and other issues in the reviewed code.

As a result of the audit, security engineers found **3** medium issues.

Disclaimers

Hacken Disclaimer

The smart contracts given for audit have been analyzed in accordance with the best industry practices at the date of this report, in relation to cybersecurity vulnerabilities and issues in smart contract source code, the details of which are disclosed in this report (Source Code); the Source Code compilation, deployment, and functionality (performing the intended functions).

The audit makes no statements or warranties on security of the code. It also cannot be considered as a sufficient assessment regarding the utility and safety of the code, bugfree status or any other statements of the contract. While we have done our best in conducting the analysis and producing this report, it is important to note that you should not rely on this report only — we recommend proceeding with several independent audits and a public bug bounty program to ensure security of smart contracts.

Technical Disclaimer

Smart contracts are deployed and executed on blockchain platform. The platform, its programming language, and other software related to the smart contract can have its vulnerabilities that can lead to hacks. Thus, the audit can't guarantee the explicit security of the audited smart contracts.